Beam-beam compensation studies with TEL2

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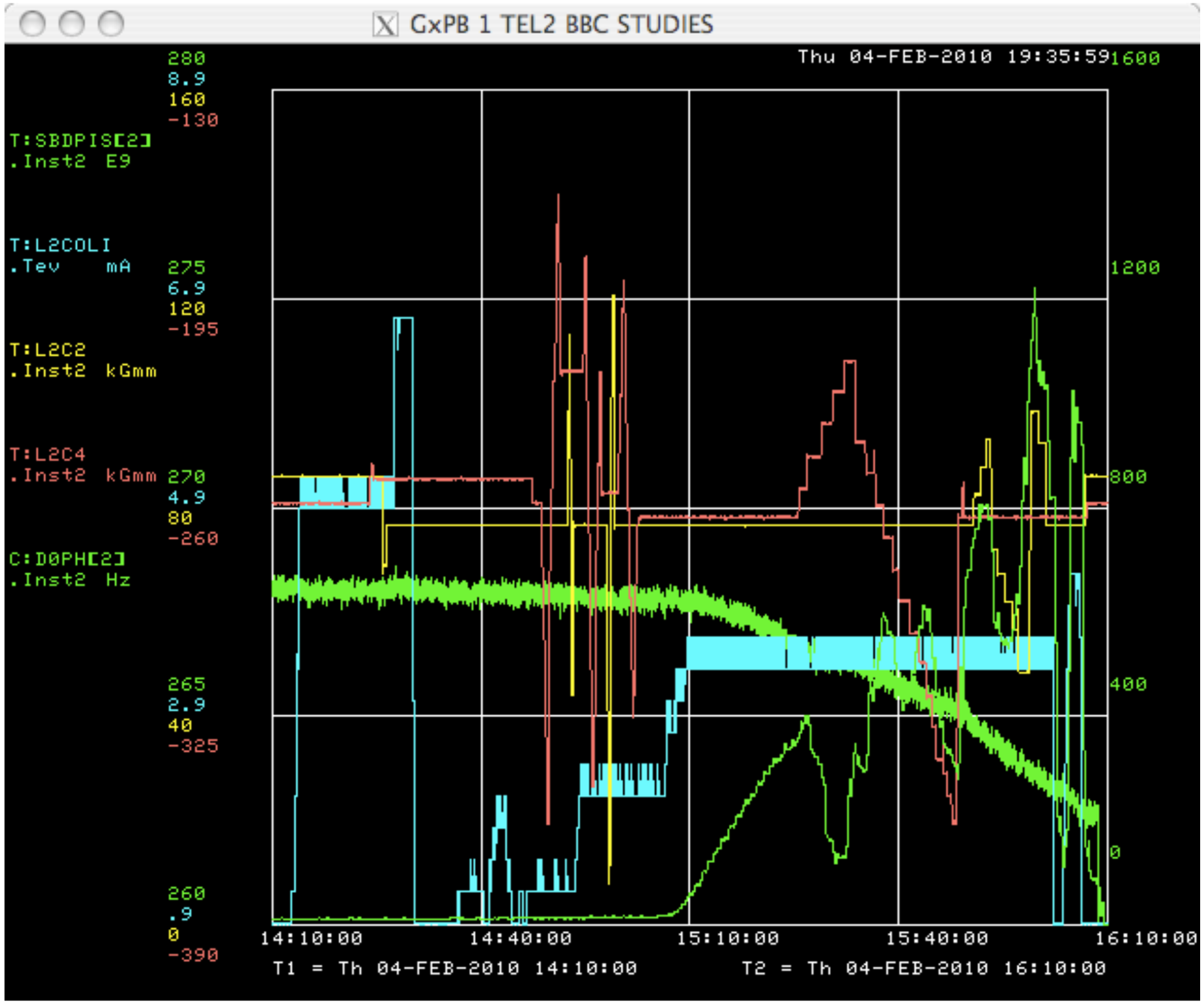
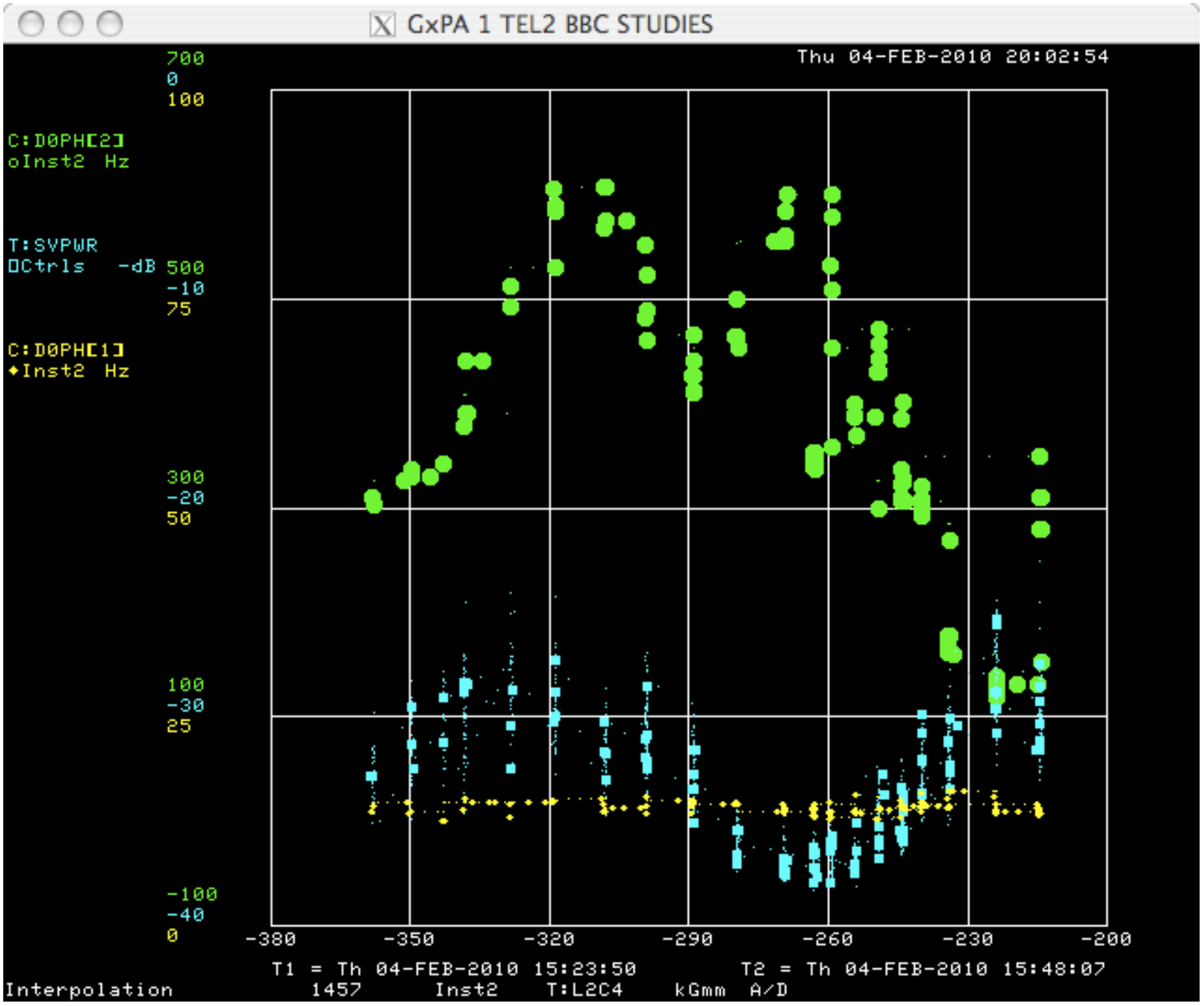
Yesterday's alignment measurements between stores #7577 and #7580
Coalesced bunches P1 and P2; no collimators

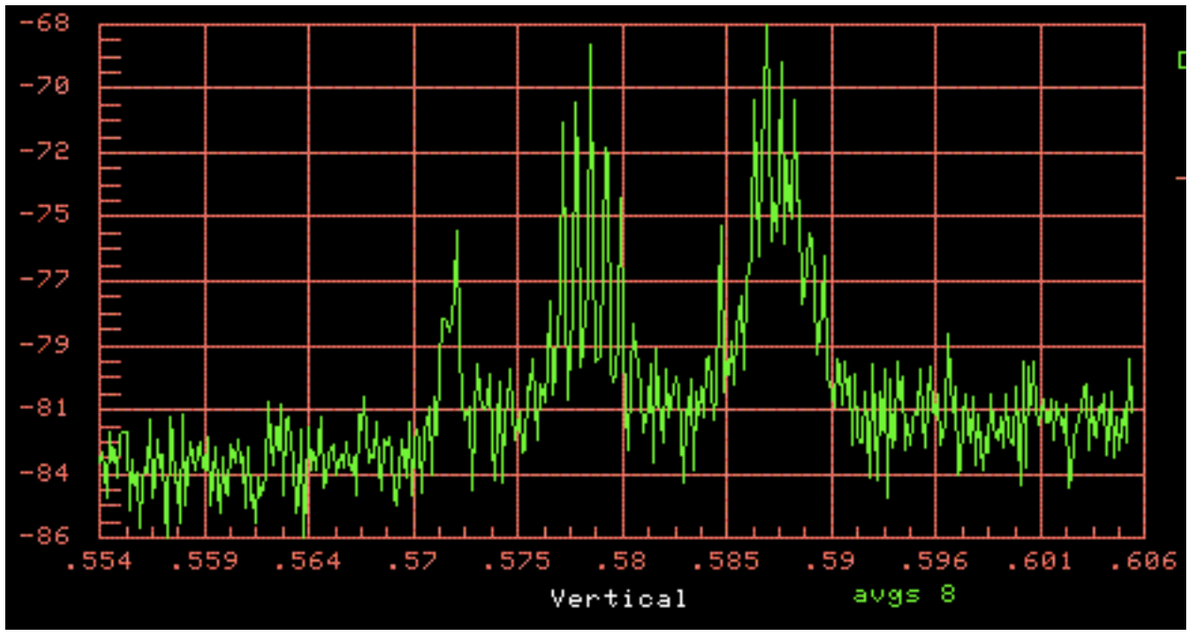




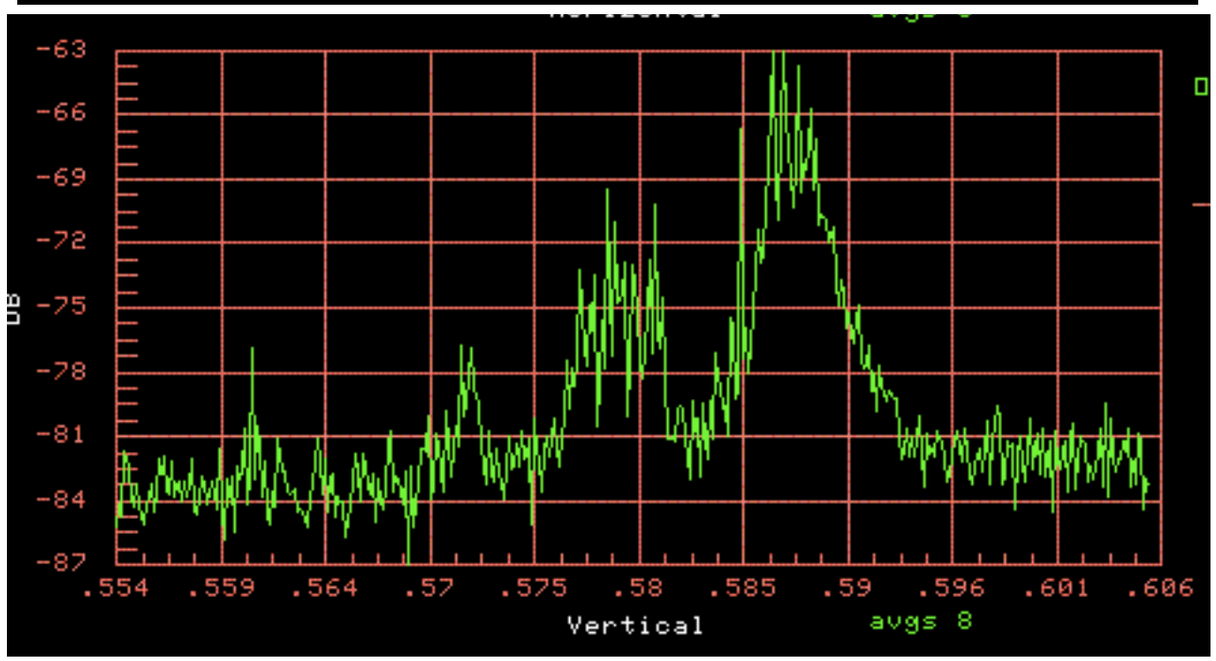
Vertical position scan on P2

Indications of vertical tune-spread changes

TEL off



TEL on



Ready for systematic study,
using digital tune meter (B11 BPM)
and Schottky

For clean observation of tune spreads vs beam overlap, need e-beam size >= (anti)proton beam size

Magnetic field in solenoid cannot be reduced below threshold for transverse-mode coupling instability

$$B_{\mathrm{thr}} \propto \frac{N_p \xi}{\sigma_p^2 \sqrt{|\nu_x - \nu_y|\, \nu_s}}$$

For protons, need to increase tune separation to about 0.02 and decrease field to 24 kG (proton-only store)

For antiprotons at end of store, experimental conditions are already favorable

Study requests to measure losses, tunes, tune spreads:

- End-of-store: acting on pbar bunch

- Proton-only store: separate tunes, decrease solenoid field to increase e-beam size